

REMARKS

Claims 1 and 7-16 are pending in this application, with claims 10-16 withdrawn from consideration. Claim 1 is amended, and claims 17-19 are newly added herein. Upon entry of this amendment, claims 1 and 7-19 will be pending, with claims 10-16 withdrawn from consideration. Entry of this amendment and reconsideration of the rejections are respectfully requested.

No new matter has been introduced by this Amendment. Support for the amendments to the claims is as follows:

Claim 1 has been amended to delete the recitation “and at a reduced pressure.” Support for amended claim 1 can be found in the specification at page 3, lines 12-27, Items 1-3 and 6; and page 11, lines 29-30. For clarity, the definite article “the” has been inserted before “gum arabic” in line 3.

Support for new claim 17 may be found in the specification at page 11, lines 28-29.

Support for new claims 18 and 19 may be found in the specification, page 3, lines 23-24, Item 5; and page 11, lines 30-32.

Claims 1, 7-9 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ikuine et al. (JP 2000-166489 and translation), hereinafter Ikuine in view of the combination of “Industrial Gums” by Whistler et al. (page 205) and Walter et al. (US 5,476,678). (Office action paragraph no. A).

The rejection of claims 1 and 7-9 is respectfully traversed and reconsideration is requested. Applicant notes that the present amendment to claim 1 broadens the scope of claim 1

by deleting the requirement for heating at a reduced pressure. New claims 18 and 19 require heating at a reduced pressure.

Applicant first of all wishes to clarify a possible point of confusion on the part of the Examiner about the recitation of claim 1. Claim 1 recites: "the step of heating dried gum arabic having a loss-on-drying of not more than 3% ..." Applicant notes that in this step, the gum arabic **starting material** has a value of loss-on-drying of not more than 3%, **before** the step of heating. The process of drying gum arabic to make the gum arabic for use in claim 1 should not be confused with the recited heating step. See, for example, Item 4 on page 3, lines 19-22, of the specification, in this regard.

In the Office action of February 17, 2011, the Examiner states in items (i) and (ii) on page 3 that the data previously submitted in the Declaration under 37 CFR filed on November 3, 2010, differed in scope from the claimed invention. Applicant therefore here supplements the previously presented data with the data in the attached Declaration by Tsuyoshi KATAYAMA, signed May 10, 2011.

The objective technical problem underlying the present invention is the provision of an improved method for modifying gum arabic, wherein the resultant gum arabic should have increased emulsifying ability, with significantly suppressed browning (brown discoloration) and/or caking. Applicant submits that the claimed invention has these desirable properties.

That is, the present invention comprises a method for producing modified gum arabic by heating the dried gum arabic, which has a diameter of not more than 1.5 mm and has a loss-on-drying of not more than 3%, at 90 to 180 °C (preferably 100-150 °C). Thereby, the present

invention is characterized in that an emulsifying ability of gum arabic is increased without exhibiting significant browning (brown discoloration) and/or caking.

In the experiment in the attached Declaration, two types of gum arabic samples having different loss-on-drying values (sample 1: 14.5%, sample 2: 2.5%; both having an average particle diameter of 1.5 mm) were heated at 80 to 190 °C for 3 to 12 hours, and the heated gum arabic samples were evaluated for the emulsifying ability, browning (brown discoloration), and the presence of caking or the formation of syrupy masses.

Note that the loss-on-drying (14.5%) of sample 1 represents a value consistent with the disclosure by Ikuine (translation), page 5, lines 13 - 17, which states that: "[t]he raw material gum arabic used to manufacture the modified gum arabic of the present invention is gum arabic whose loss on drying is 50 wt% or less, . . . and even more preferably 15 wt% or less." Sample 2 corresponds to gum arabic having a loss-on-drying of not more than 3%, as required by present claim 1.

As is clear from the experimental results (see Table I on page 3 of the Declaration), heating sample 1, having a loss-on-drying of 14.5%, at 80 °C did not improve its emulsifiability and caused a problem of caking. In contrast, heating sample 2, having a loss-on-drying of 2.5%, at 80 to 190 °C did not cause problems such as caking or forming syrupy masses. Further, the results show that heating sample 2 having a loss-on-drying of 2.5% at a temperature higher than 80°C and lower than 190°C, particularly in the range of 100 to 150 °C, can improve the emulsifying ability of gum arabic, without the above-described problems such as caking or forming syrupy masses. It is also clear that when sample 2, having a loss-on-drying of 2.5%, was heated in the above temperature range, the coloration degree was significantly lower than that of

sample 1, having a loss-on-drying of 14.5%, and that browning (brown discoloration) was significantly suppressed.

Specifically, as described above, the experimental data indicate that heating the dried gum arabic, which has an average particle diameter of not more than 1.5 mm and has a loss-on-drying of not more than 3% at 90-180°C (preferably 100-150°C) results in obtaining modified gum having an improved emulsifiability without caking and with significantly suppressed brown discoloration. At the same time, the experimental data also show that the above-described effects of the present application cannot be achieved even when heating gum arabic having a loss-on-drying of 14.5%, which is outside the claimed range but within the range not more than 15% described as being preferable in Ikuine, under the same conditions.

The cited art of Ikuine et al., Whistler et al., and Walter et al. nowhere describe or suggest heating gum arabic having a specific loss-on-drying of not more than 3%. Moreover, these references nowhere describe or suggest the occurrence of problem such as caking or forming syrupy masses caused by the heating of gum arabic having a loss-on-drying greater than a specific value. Therefore, the observed results of the present invention—improvement of the emulsifiability of gum Arabic while avoiding problem such as caking or forming syrupy masses—are unexpected over the cited references. Accordingly, Applicant has demonstrated unexpected results commensurate in scope with the limitations of claim 1.

In other words, that heating gum arabic having a specific loss-on-drying of not more than 3% at 90-180 °C can improve the emulsifiability of gum arabic while avoiding problem such as caking and/or forming syrupy masses and suppressing brown discoloration, is an effect that is unpredictable from prior art.

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Thus, claims 1 and 7-9, as well as new claims 17-19, are not obvious over Ikuine et al., Whistler et al. and Walter et al., taken separately or in combination.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants' undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosures: Request for Continued Examination (RCE)
Declaration under 37 CFR 1.132 by Mr. Tsuyoshi Katayama, signed May 10, 2011 (4 pages)